

Introduction

The eye has two primary focusing structures. The first is the cornea. The clear front surface of the eye has the majority of focusing power. The second structure is the intraocular lens, within the eye, immediately behind the coloured iris (Fig 1). This lens is flexible and it constitutes the mechanism by which the eye's power can be adjusted to maintain a focused image at a variety of distances.

The total ocular system, including the cornea and relaxed lens, of a perfectly sighted eye should bring the parallel rays of light from a distant object to a focus at the retina (Fig 1). When viewing a closer object more ocular power is required so a muscle contracts to flex the lens effectively increasing its power. Therefore when reading your lens flexes, and when you look up again it relaxes.

Hyperopia

If an eye is long sighted (Hyperopic) the eye length is too short in relation to the focal point of the optical system (Fig 2). Most people who do not wear glasses are long sighted. By physically focusing with their intra ocular lenses (as if they were reading) these people can draw the focus of their eyes forward and onto the retina thus creating clear vision (Fig 2). If the hyperopia is mild then spectacles are often not required as the eyes are capable of readjusting the focus without any discomfort.

At higher levels of hyperopia the focusing required to draw the image onto the retina will become too great and symptoms of eye strain or headaches, particularly while reading, will result. In these cases correction would be required. The theoretical correction prescribed would be the distance power, that is to say the power which allows the eye to see clearly in the distance with the intra ocular lens in a relaxed state (Fig 3). These people may think of their glasses as reading glasses because that is when they feel most benefit. They still have to focus their eyes to read, however they are putting in a normal amount of effort to do so, not the excessive amount required when they have first to overcome the distance blur before focusing further for near. So these people may still do most things without spectacles but will put them on for near work.

Absolute hyperopia is when the eyes are so long sighted that the effort to focus, even at distance, is too great. These people will find not only close work difficult but distance vision will also be blurred. They will probably need to wear their spectacles constantly.

Variations In Spectacle Use

The need for long sighted correction varies immensely. A lot of hyperopes do not need spectacles at all, others use glasses intermittently while others need them constantly and may even show an eye turn without correction. Prescribing glasses to low hyperopes often depends on the symptoms. If someone presents with no difficulties and slight long sightedness then spectacles would probably not be prescribed. The same power may be prescribed to someone else if they were reporting symptoms which could be attributed to the hyperopia.

Spectacle Powers

An uncorrected hyperope is constantly focusing with their intra ocular lenses to see clearly. For them this is a natural state of affairs. This means that sometimes we need to put drops in children's eyes to force their lenses to relax to find the full magnitude of their long sightedness.

Because they are so used to doing this their lenses do not automatically relax when a prescription is given but remains in a focusing state. Also it is often impossible to give the full prescription to someone since their lenses are so spasmed that the glasses will appear blurred and be very uncomfortable to wear. In this situation we may prescribe a lower power perhaps 2/3 of full power at first and then gradually increase it over several months or years in steps which the patient can tolerate. Increases in power, therefore, do not always indicate that the eyes have worsened but more likely show that the optometrist has not given the full prescription in the first place and is simply topping it up slightly.

